

MONITORING PEST POPULATIONS INSIDE AND OUTSIDE FOOD PROCESSING FACILITIES

James F. Campbell* and Michael M. Mullen
Grain Marketing and Production Research Center
USDA-ARS, 1515 College Avenue, Manhattan, KS 66502

In the search for methyl bromide alternatives for control of insects in food processing and storage facilities, the development of more effective monitoring programs is needed. Use of pheromone traps to monitor insect populations has increased in the industry, but the interpretation of insect capture information has been problematic. Accurate information to guide the timing and targeting of treatments and evaluate their effectiveness has been lacking. Here we used a combination of approaches to investigate the way that pest populations responded to methyl bromide fumigation and assessed some potential mechanisms of pest resurgence after treatment.

We used a three-pronged approach to assess populations of *Trogoderma* spp. and *Plodia interpunctella* in and around a food processing and storage facility. Contour mapping of data from pheromone traps placed both inside and outside the plant was used to assess pest temporal and spatial distribution. Cylinders of flour with insects buried at different depths were used to assess fumigant penetration. A self-marking/recapture system was used to determine patterns of insect movement inside and outside of the facility.

Our results indicate that pheromone trap catch data can identify pest 'hot spots' that are potential targets for control, but that not all pheromone trap catch 'hot spots' indicate infestation 'hot spots'. Populations of *Trogoderma* can recover rapidly from methyl bromide fumigation. Pest populations outside of facilities can be large and highly mobile and movement into facilities after fumigation may contribute to reinfestation. In addition, the degree of penetration by the fumigant can be highly variable and may enable insects to persist in refugia.